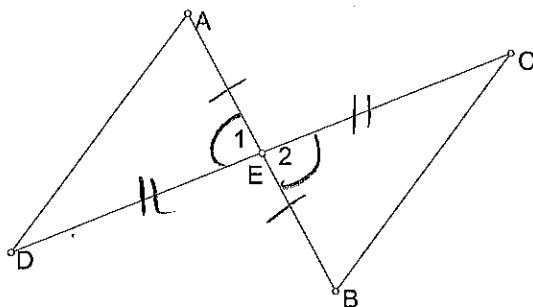


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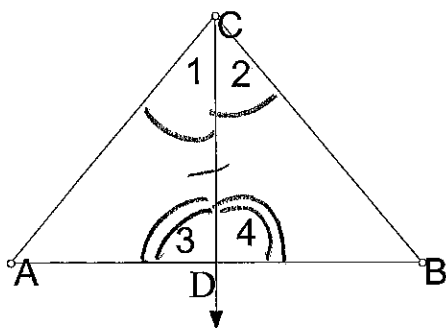
## 201 Chapter 4: Proofs Using CPCTC (4.6)

1. Given: E is the midpoint of  $\overline{AB}$  and  $\overline{CD}$   
 Prove:  $\angle D \cong \angle C$



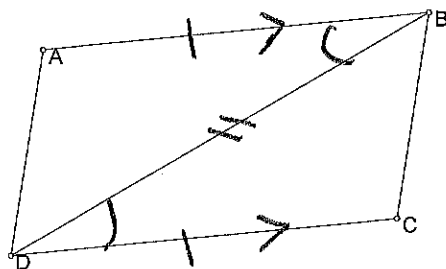
Statements	Reasons
① ~	① Given
② $\overline{AE} \cong \overline{BE}$ $\overline{DE} \cong \overline{CE}$	② def of midpt
③ $\angle 1 \cong \angle 2$	③ vert $\angle$ s $\cong$
④ $\triangle ADE \cong \triangle BCE$	④ SAS
⑤ $\angle D \cong \angle C$	⑤ CPCTC

2. Given:  $\overrightarrow{CD}$  bisects  $\angle ACB$ ;  $\angle 3 \cong \angle 4$   
 Prove:  $\angle A \cong \angle B$



Statements	Reasons
① ~	① Given
② $\angle 1 \cong \angle 2$	② def of bis.
③ $\overline{CD} \cong \overline{CD}$	③ Reflexive
④ $\triangle ACD \cong \triangle BCD$	④ ASA
⑤ $\angle A \cong \angle B$	⑤ CPCTC

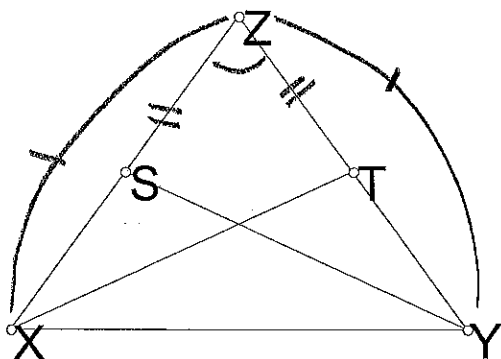
3. Given:  $\overline{AB} \cong \overline{CD}$ ;  $\overline{AB} \parallel \overline{CD}$   
 Prove:  $\overline{AD} \cong \overline{CB}$



Statements	Reasons
① ~	① Given
② $\overline{DB} \cong \overline{DB}$	② Reflexive
③ $\angle ABD \cong \angle CDB$	③ Alt int $\angle$ s thm
④ $\triangle ABD \cong \triangle CDB$	④ SAS
⑤ $\overline{AD} \cong \overline{CB}$	⑤ CPCTC

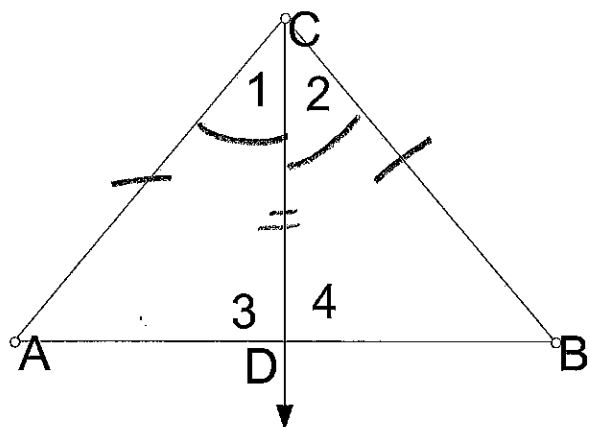
4. Given:  $\overline{XZ} \cong \overline{YZ}$  (Hint: separate the triangles)  
 $\overline{ZT} \cong \overline{ZS}$

Prove:  $\angle YSZ \cong \angle XTZ$



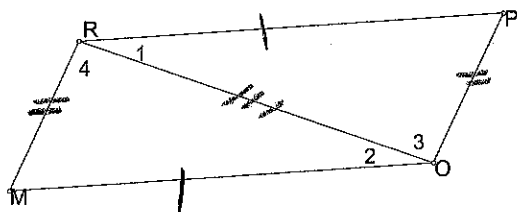
Statements	Reasons
① $\sim$	① Given
② $\angle Z \cong \angle Z$	② Reflexive
③ $\triangle XTZ \cong \triangle YSZ$	③ SAS
④ $\angle XTZ \cong \angle YSZ$	④ CPCTC
⑤ $\angle YSZ \cong \angle XTZ$	⑤ Symmetric

5. Given:  $\overline{AC} \cong \overline{BC}$ ;  $\angle 1 \cong \angle 2$   
 Prove:  $\overline{DA} \cong \overline{DB}$



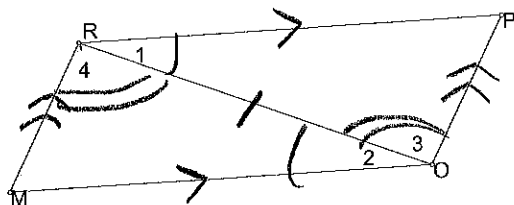
Statements	Reasons
① $\sim$	① Given
② $\overline{CD} \cong \overline{CD}$	② Reflexive
③ $\triangle ACD \cong \triangle BCD$	③ SAS
④ $\overline{DA} \cong \overline{DB}$	④ CPCTC

6. Given:  $\overline{MO} \cong \overline{PR}$ ;  $\overline{RM} \cong \overline{OP}$   
 Prove:  $\angle 1 \cong \angle 2$



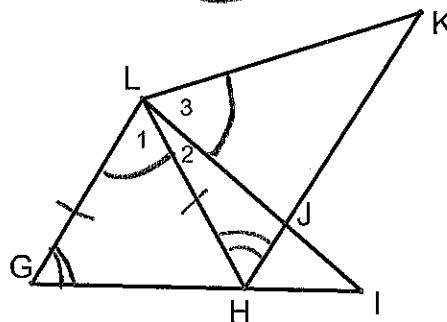
Statements	Reasons
① $\sim$	① Given
② $\overline{RO} \cong \overline{RO}$	② Reflexive
③ $\triangle RMO \cong \triangle OPR$	③ SSS
④ $\angle 1 \cong \angle 2$	④ CPCTC

7. Given:  $\overline{RP} \parallel \overline{OM}$ ;  $\overline{RM} \parallel \overline{PO}$   
 Prove:  $\overline{RM} \cong \overline{OP}$



Statements	Reasons
① $\sim$	① Given
② $\angle 1 \cong \angle 2$ $\angle 3 \cong \angle 4$	② Alt Int $\angle$ s Thm
③ $\overline{RO} \cong \overline{RO}$	③ Reflexive
④ $\triangle RMO \cong \triangle OPR$	④ ASA
⑤ $\overline{RM} \cong \overline{OP}$	⑤ CPCTC

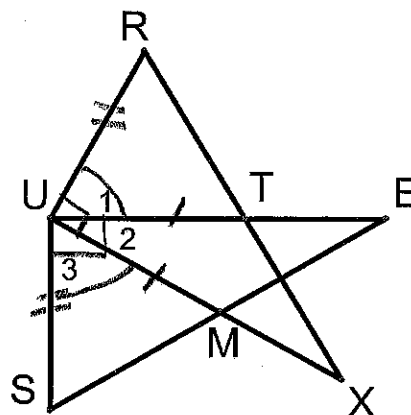
8. Given:  $m\angle 1 = m\angle 3$ ;  $\overline{LG} \cong \overline{LH}$ ;  $\angle G \cong \angle LHJ$   
 Prove:  $\triangle GLI \cong \triangle HLK$



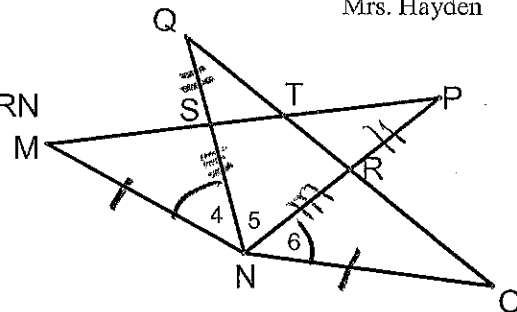
Statements	Reasons
① $\sim$	① Given
② $m\angle 2 = m\angle 2$	② Ref
③ $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	③ Add
④ $m\angle 1 + m\angle 2 = m\angle GLI$ $m\angle 3 + m\angle 2 = m\angle KLH$	④ AAP
⑤ $m\angle GLI = m\angle KLH$	⑤ Subs
⑥ $\angle GLI \cong \angle KLH$	⑥ def of $\cong$
⑦ $\triangle GLI \cong \triangle HLK$	⑦ ASA

9. Given:  $\overline{RU} \perp \overline{UM}$ ;  $\overline{UT} \perp \overline{US}$ ;  $\overline{UT} \cong \overline{UM}$ ;  $\overline{UR} \cong \overline{US}$   
 Prove:  $\overline{TR} \cong \overline{MS}$

Statements	Reasons
1. $\sim$	1. Given
2. $\angle 1 + \angle 2$ are compl	2. (The Complement Theorem) If the non-adjacent sides of two acute $\angle$ s are $\perp$ , then the $\angle$ s are complementary.
3. $\angle 3 + \angle 2$ are compl	3. (same as #2)
4. $\angle 1 \cong \angle 3$	4. $\cong$ Compl. Thm
5. $\triangle UTR \cong \triangle UMS$	5. SAS
6. $\overline{TR} \cong \overline{MS}$	6. CPCTC

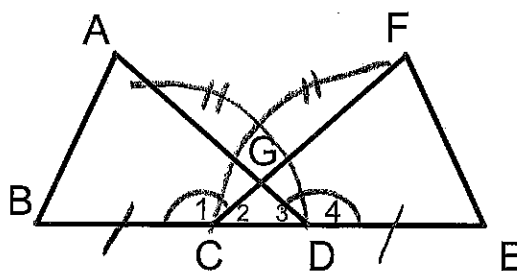


10. Given:  $m\angle 4 = m\angle 6$ ;  $\overline{MN} \cong \overline{NO}$ ;  $QS = PR$ ;  $SN = RN$   
 Prove:  $\triangle MNP \cong \triangle ONQ$



Statements	Reasons
① ~	① Given
② $m\angle 5 = m\angle 5$	② Refl.
③ $m\angle 4 + m\angle 5 = m\angle 6 + m\angle 5$	③ Add
④ $m\angle 4 + m\angle 5 = m\angle MNP$ $m\angle 6 + m\angle 5 = m\angle ONQ$	④ AAP
⑤ $m\angle MNP = m\angle ONQ$	⑤ Subs
⑥ $\angle MNP \cong \angle ONQ$	⑥ def of $\cong$
⑦ $QS + SN = PR + RN$	⑦ Add
⑧ $QS + SN = QN$ $PR + RN = PN$	⑧ SAP
⑨ $QN = PN$	⑨ Subs
⑩ $\overline{QN} \cong \overline{PN}$	⑩ def of $\cong$
⑪ $\triangle MNP \cong \triangle ONQ$	⑪ SAS

11. Given:  $\overline{BC} \cong \overline{DE}$ ;  $\angle 1 \cong \angle 4$ ;  $\overline{AD} \cong \overline{FC}$   
 Prove:  $\overline{AB} \cong \overline{FE}$

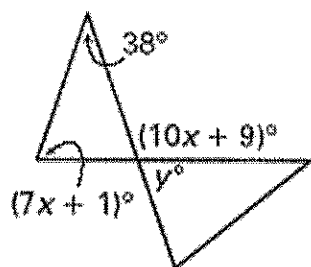


Statements	Reasons
① ~	① Given
② $CD = CD$	② Refl.
③ $BC + CD = CD + DE$	③ Add
④ $BC + CD = BD$ $CD + DE = CE$	④ SAP
⑤ $BD = CE$	⑤ Subs
⑥ $\overline{BD} \cong \overline{CE}$	⑥ def of $\cong$
⑦ $\angle 1 + \angle 2$ are LP $\angle 3 + \angle 4$ are LP	⑦ def of LP
⑧ $\angle 1 + \angle 2$ are suppl. $\angle 3 + \angle 4$ are suppl.	⑧ LPP
⑨ $\angle 2 \cong \angle 3$	⑨ $\cong$ suppl. $\angle$ s
⑩ $\triangle ABD \cong \triangle FEC$	⑩ SAS

⑪  $\overline{AB} \cong \overline{FE}$  ⑪ CACTC

Solve for x and/or y.

12.



$$10x + 9 = 7x + 1 + 38$$

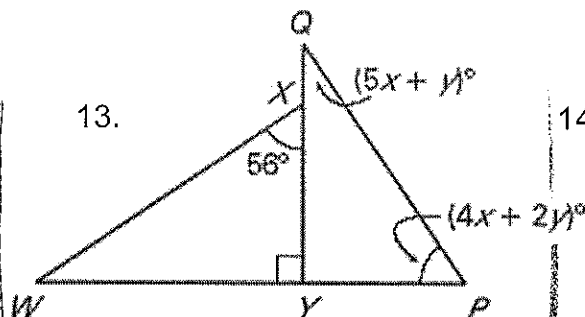
$$3x = 30$$

$$x = 10$$

$$y + (10(10) + 9) = 180$$

$$y = 71$$

13.



$$56 = 4x + 2$$

$$34 = 5x + 1$$

$$56 = 4x + 2$$

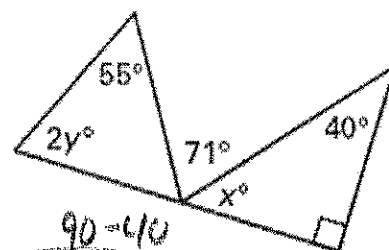
$$-68 = -4x - 2$$

$$-12 = -4x$$

$$2 = x$$

$$y = 24$$

14.



$$90 - 40 = 50$$

$$x = 50$$

$$\begin{array}{r} 50 \\ + 71 \\ \hline 121 \end{array}$$

$$121 = 2y + 55$$

$$66 = 2y$$

$$33 = y$$

15. Find all of the measurements of the numbered angles.

$$m\angle 1 = 60$$

$$m\angle 2 = 120$$

$$m\angle 3 = 60$$

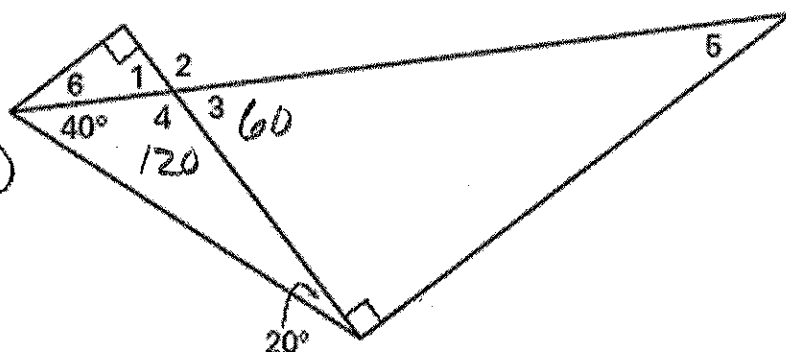
$$m\angle 4 = 120$$

$$m\angle 5 = 30$$

$$m\angle 6 = 30$$

$$180 - (40 + 20 + 90)$$

$$90 - 60$$



16. Find all of the values of x that make the two triangles congruent.

$$7x = 6x + 2$$

$$8x - 8 = x + 6$$

$$x = 2$$

$$7x = 14$$

$$x = 2$$

$$7x = x + 6$$

$$8x - 8 = 6x + 2$$

$$6x = 6$$

$$2x = 10$$

$$x = 1$$

$$x = 5$$

